Activation of synovial fibroblasts (mesenchymal stem cell-like cells) in arthritic joints and treatment with high molecular weight hyaluronan

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Many patients with OA or RA are being treated with hyaluronan (HA), NSAID, steroid, and other chemical and biological drugs, but the pathology of joint diseases has not been fully understood. In arthritic joints, synovial fibroblasts are involved in HA metabolism and ectopic osteophyte/chondrophyte formation: Both of which are crucial to joint diseases. In other words, synovial fibroblasts are mesenchymal stem cell (MSC)-like cells with high proliferation and matrix-degrading activities.

To characterize self-renewal and multi-potency of MSC and synovial fibroblasts, we identified MSC-characteristic genes, including several transcription factors, and found that these genes were essential for "stemness" of these cells. In addition, we compared gene expression levels of various HAS, HYAL, and HABP in synovial fibroblasts and MSC - using DNA chips. I also introduce recent topics of high molecular weight HA.